

WHAT IS CLAIMED IS:

1. An apparatus comprising:

an inertia wheel having a leftside and rightside, said inertia wheel rigidly attached to a center axle, said inertia wheel and center axle adapted to unitarily rotate about a center axis;

an axle support adapted to rotatably support said center axle such that said inertia wheel and center axle may freely spin about the center axis;

a generally planar leftside cam supporting structure laterally positioned from said leftside of said inertia wheel such that said leftside cam supporting structure and said inertia wheel are evenly spaced from each other in a parallel manner, said leftside cam supporting structure including a leftside inverse cam;

a generally planar rightside cam supporting structure laterally positioned from said rightside of said inertia wheel such that said rightside cam supporting structure and said inertia wheel are evenly spaced from each other in a parallel manner, said rightside cam supporting structure including a rightside inverse cam;

a plurality of transfer follower arm assemblies interconnecting said leftside and rightside of said inertia wheel to said leftside and rightside cam supporting structure;

wherein rotational movement of said inertia wheel is at least one of conditioned, controlled, regulated, governed and influenced as a function of a profile of said leftside and rightside cam.

2. The apparatus according to claim 1, each one of said plurality of transfer follower arm assemblies comprising:

a transfer arm structure having a main body with a connecting wrist integrally formed on one end and a pair of forks integrally formed on an opposing end,

said connecting wrist rotatably attached to an attachment point on one of said leftside and rightside of said inertia wheel, said attachment point defined by a radius R from the center axis;

said main body having an axle receiving hole transversely oriented within said main body,

said pair of forks including an outboard fork laterally spaced apart from an inboard fork, said inboard fork further including a wheel catch integrally formed on a distal end of said inboard fork;

a weighted orbital drive wheel rigidly fit onto a first transmission axle transversely and rotatably mounted to said pair of forks such that said orbital drive wheel may freely spin between said pair of forks;

a first transmission gear rigidly fit onto a portion of said first transmission axle extending from an exterior side of said inboard fork;

a second transmission gear rigidly fit onto an inner exterior portion of a second transmission axle rotatably secured within the axle receiving hole transversely oriented within said main body, said second transmission gear positioned such that said second transmission gear intermeshes with said first transmission gear, said second transmission gear having a greater diameter than that of said first transmission gear;

a drive gear rigidly fit onto an outer exterior portion of said second transmission axle; and

a cam track retaining system comprising a retaining member having one end rotatably attached to said second transmission axle and further positioned between said drive gear and said transfer arm structure, and at least one retaining wheel rotatably attached to another end of said retaining member.

3. The apparatus according to claim 1, said leftside and rightside inverse cam integrally formed into said respective leftside and rightside cam supporting structure, each supporting structure having a void defined by a crescent shaped perimeter, wherein said plurality of transfer arm assemblies are adapted to be movably attached to said crescent shaped perimeter.

4. The apparatus according to claim 3, said inverse cam further comprising an inwardly protruding rail integrally formed along said crescent shaped perimeter, said rail protruding from an inboard side of said respective leftside and rightside cam supporting structure and oriented perpendicular to said respective leftside and rightside cam supporting structure.

5. The apparatus according to claim 4, said inwardly protruding rail having an inner side adapted to interface to at least one retaining wheel and an outer side having gear teeth

disposed on the surface thereof, said gear teeth adapted to intermesh with a drive gear of one of said plurality of transfer arm assemblies.

6. The apparatus according to claim 1, wherein each of said plurality of transfer follower arm assemblies comprises a connecting wrist rotatably attached to a side of said inertia wheel and a cam track retaining system adapted to movably couple said transfer follower arm assembly to said respective leftside or rightside inverse cam.

7. The apparatus according to claim 2, wherein each connecting wrist is attached to said side of said inertia wheel along a radial perimeter having a radius R from the center axis of said apparatus.

8. The apparatus according to claim 7, said plurality of transfer follower arm assemblies comprising,

- a first and second leftside transfer follower arm assembly positioned between a leftside of said inertia wheel and said leftside cam supporting structure; and

- a first and second rightside transfer follower arm assembly positioned between a rightside of said inertia wheel and said rightside cam supporting structure;

- said connecting wrist of said first leftside transfer follower arm assembly attached to a rotational attach point $L1$ positioned on said leftside of said inertia wheel about the radial perimeter defined by R ;

- said connecting wrist of said second leftside transfer follower arm assembly attached to a rotational attach point $L2$ positioned on said leftside of said inertia wheel about the radial perimeter defined by R , and positioned 180 degrees from said attach point $L1$;

- said connecting wrist of said first rightside transfer follower arm assembly attached to a rotational attach point $R1$ positioned on said rightside of said inertia wheel about the radial perimeter defined by R ;

- said connecting wrist of said second rightside transfer follower arm assembly attached to a rotational attach point $R2$ positioned on said rightside of said inertia wheel about the radial perimeter defined by R , and positioned 180 degrees from said attach point $R1$;

wherein R1 is further positioned about the radial perimeter such that R1 is spaced 90 degrees from both L1 and L2, and positioned there between L1 and L2 along the radial perimeter; and

wherein R2 is further positioned about the radial perimeter such that R2 is spaced 90 degrees from both L1 and L2, and positioned there between L1 and L2 along the radial perimeter.

9. The apparatus according to claim 2, said inertia wheel further comprising a plurality of catching members positioned proximate a outer perimeter of said leftside and rightside of said inertia wheel, said plurality of catching members protruding from said leftside and rightside of said inertia wheel in a perpendicular orientation.

10. The apparatus according to claim 9, wherein said wheel catch of said transfer arm structure is adapted to engage one of said plurality of catching members.

11. The apparatus according to claim 10, wherein when said inertia wheel rotates about the center axis, said cam track retaining system on each of said plurality of transfer follower arm assemblies travels around a perimeter of said inverse cam.

12. The apparatus according to claim 11, wherein when said wheel catch of said transfer arm engages one of said plurality of catching members, an individual arm cycle is initiated.

13. The apparatus according to claim 12, wherein a transfer follower arm circumvents the perimeter of said inverse cam in one cycle.

14. The apparatus according to claim 13, wherein an individual arm cycle correlates to one revolution of said inertia wheel.

15. The apparatus according to claim 14, wherein the motion of each of said transfer follower arms is measured according to a 360 degree grid imposed on a side of said inertia wheel, 0 degrees indicating a position similar to a 12 o'clock position on a conventional clock , and

wherein said wheel catch engages one of said plurality of catching members at about 60 degrees, therefore initiating an individual arm cycle.

16. The apparatus according to claim 15, wherein said catching member maintains engaged with said wheel catch between about 60 and 240 degrees during an individual cycle.

17. The apparatus according to claim 15, wherein said wheel catch disengages with said catching member at about 240 degrees.

18. The apparatus according to claim 16 wherein when said wheel catch disengages said catching member, said transfer follower arm reverses direction by swinging in an upwardly translational movement across said leftside or rightside of said inertia wheel.

19. The apparatus according to claim 17, wherein rotational inertia from said orbital drive wheel assists movement of said transfer follower arm between 240 and 60 degrees.